

The specimen was subjected to various wind/rain conditions at a pitch of 5° . These test conditions have been derived from a combination of field experience and analysis of Met records, and equate to a return period of approximately 50 years.

i). Deluge Test.

Water was sprayed onto the roof; with no wind, at a rate equivalent to a rainfall of 225 mm/hour over the whole roof. The runoff sparge bar at the top of the test section simulated a rainfall of 225 mm/hour over the additional 10m of roof. The test lasted for ten minutes whilst an observer beneath the roof checked for the possible occurrence of water ingress through the specimen, onto the inside of the pressure box.

ii). Test I - High Rain, Low wind.

Water was sprayed at a rate equivalent to a rainfall of 128 mm/hour over the test area with the runoff sparge bar providing a flow equivalent to 128 mm/hour over the additional 10m of roof. During the test the wind tunnel was run at a constant speed of 5 m/s.

In some of the tests, when the pressure box was attached to the underside of the test roof, the internal 'attic pressure' was controlled by means of a variable speed fan. The pressure difference measured across the specimen was gauged using a pressure tapping on the exterior of the roof; and an array of pressure tappings connected to a manifold inside the pressure box. As a guide, the pressure on the external surface of the roof was more than the pressure inside the perspex box, giving a net flow in through the system.

The tests which incorporated the pressure box consisted of five-minute periods of pressure increment; starting at 'zero pressure' and increasing until an appropriate degree of failure had occurred or the specimen had reached the most extreme pressure condition. For the tests with no pressure box attached, the internal 'attic' pressure could not be regulated so the test was simply conducted at the prescribed rain and wind condition for ten minutes.

iii). Test 11 - Mid Condition.

Water was sprayed at a rate equivalent to a rainfall of 40 mm/hour over the test area with the runoff sparge bar providing a flow equivalent to 40 mm/hour over the additional 10m of roof. During the test the wind tunnel was run at a constant speed of 14.5 m/s. Tests were conducted as in the previous wind and rain condition.

iv). Test 111-Low Rain, High Wind.

Water was sprayed at a rate equivalent to a rainfall of 5 mm/hour over the test area with the runoff sparge bar providing a flow equivalent to 5 mm/hour over the additional 10m of roofing. The test the wind tunnel was run at a constant speed of 25 m/s. Tests were conducted as in the previous wind and rain conditions.

The Weathertightness Rig is fully calibrated to provide a consistent and even distribution of rain across the whole of the 3m x 2.5m test roof at a pitch of 15° . However, these tests were conducted at 5° with the horizontal spray bars set for a 15° pitch test. Although this caused concentrations of rain in the lower section of the roof at higher pitches, the roof was suitably 'wetted' by the existing spray bar arrangement and the tests were, therefore, relevant.